

Remarks

Claims 1-70 were originally pending in this application. Claims 1-20, 30-39, 46-50, and 56-61 are canceled without prejudice or disclaimer as being drawn to a non-elected invention. Claim 55 is also canceled without prejudice or disclaimer. Claims 40, 51, and 62 are currently amended without introducing new matter. As a result, claims 21-29, 40-45, 51-54, and 62-70 are pending for examination with claims 21, 40, 51, 62, 68, and 70 being independent claims.

Election/Restriction

Applicants confirm election of the invention of Group II, claims 21-29 and 40-45 as well as generic claims 51-55 and 62-70, for prosecution in this application, with traverse.

Applicants respectfully traverse the requirement and request examination of all claims because no undue burden would result from the examination of all claims.

Rejections Under 35 U.S.C. § 102

Claims 21-26, 40-41, and 44-45 are rejected under 35 U.S.C. § 102(e) as being anticipated by the teaching of Willman et al. in U.S. Patent Publication No. US2004/0118780 (hereinafter Willman).

Applicants disagree that the teaching of Willman anticipates claims 21-26, 40-41, and 44-45. Willman teaches a water purification system and method for producing high-purity, laboratory-quality product water from feed water. The purification system is based on a reverse osmosis unit and incorporates a capacitive deionization module. The module is disposed in a recirculation path to remove dissolved ions from the concentrate stream from the reverse osmosis unit. Purified water from the module is then reintroduced into an inlet of the reverse osmosis unit. (Willman at paragraph 0007). A reservoir or storage tank 26 is disposed to receive high-purity product water from the permeate side of the reverse osmosis unit.

This tank, however, is not fluidly connected to a point of entry. Reverse osmosis is a process that involves forcing a solvent of a solution from a region of high solute concentration through a membrane to a region of low solute concentration by applying a pressure in excess of the osmotic pressure of the solution. The pore-less membrane is semi-permeable and allows passage of the solvent but not the solute thereby isolating the solute-rich side from the permeate side. Because the system disclosed by Willman incorporates a reverse osmosis unit upstream of

the storage tank 26, the storage tank 26 is fluidly isolated from a point of entry that provides water to be purified. Thus, the teaching of Willman fails to disclose a treatment system comprising a reservoir system fluidly connected to a point of entry. Moreover, Willman fails to disclose a treatment system comprising an auxiliary use that is fluidly connected downstream of the electrochemical device. Therefore, the teaching of Willman cannot anticipate independent claim 21 because it fails to disclose each and every element recited therein.

Dependent claims 22-26 depend from independent claim 21. These dependent claims are also novel over the teaching of Willman for at least the same reasons discussed above.

Likewise, Willman also fails to disclose a method for treating water comprising a step of introducing water from a point of use to a reservoir system. The permeate from the reverse osmosis device in the system disclosed by Willman is delivered to a storage tank 26. Thus, contrary to what is asserted, Willman fails to disclose a step of introducing water from a point of entry to a reservoir system for substantially the same reasons discussed above. Willman also fails to disclose a method of treating water comprising a step of transferring a portion of discharge water from an electrochemical device to an auxiliary use. Therefore, Willman cannot anticipate independent claim 40 because it also fails to teach each and every element recited therein.

Similarly, dependent claims 41 and 44-45 depend from independent claim 40. These dependent claims further recite additional features of the invention and are also novel over the teaching of Willman for at least the same reasons discussed above.

Claims 51-55, 62, 65, and 68-70 are rejected under 35 U.S.C. § 102(b) as being anticipated by the teaching of Hirayama et al. in U.S. Patent No. 6,461,512 (hereinafter Hirayama). Applicants disagree.

Hirayama teaches the method of disinfecting an apparatus that produces deionized water. In FIGS. 2a and 2b, Hirayama teaches a conventional system used to provide purified water to a pharmaceutical manufacturing facility. The system includes a tank that is fluidly connected to a source of water. A pump P0 withdraws water from the tank and pressurizes the water for delivery through several purification unit operations including an activated carbon tower, a safety filter 3, and a membrane degassing apparatus 4. A heat exchanger HE1 is disposed upstream of the pretreatment unit operations to provide heated water. From the pretreatment

systems, water is then introduced into a reverse osmosis membrane apparatus 5. Permeate from the reverse osmosis apparatus 5 is then introduced into an electrodeionization apparatus 6. In FIGS. 1a and 1b, Hirayama teaches an electrodeionization apparatus used to produce deionized water. The system has essentially the same unit operations as illustrated in FIGS. 2a and 2b except that the heat exchangers precede the electrodeionization apparatus 6. In FIG. 3, Hirayama discloses another electrodeionization system for producing deionized water. In this configuration, water from a point of entry is heated in a heat exchanger 21 and is then filtered in a microfiltration apparatus 22 and further treated in an activated carbon tower 23. The pretreated water is then fed into a tank 24. Pump P withdraws water from the tank and delivers the pressurized water to a reverse osmosis apparatus 25. Permeate from the reverse osmosis apparatus 25 is then heated in a heat exchanger 26 prior to being introduced into an electrodeionization device 27.

Hirayama however fails to disclose a water treatment system comprising a means for accumulating water from a water source at a pressure that is above atmospheric pressure and also fails to disclose a treatment system that has an electrochemical device fluidly connected to the means for accumulating water. As noted above, Hirayama teaches a system that receives water in tank 1 and withdraws water from the tank to pressurize it with a pump P. Thus, it is clear that the tank disclosed by Hirayama serves to collect the water but cannot be considered as a means for accumulating water from a water source that is at a pressure above atmospheric pressure. Further, because the system disclosed by Hirayama includes a reverse osmosis device upstream of an electrochemical device, such that permeate from the reverse osmosis device is introduced into the electrochemical device, the electrochemical device is fluidly isolated from the means for accumulating water. Accordingly, independent claim 51 cannot be anticipated by the teachings of Hirayama because the reference fails to disclose each and every element recited therein.

Dependent claims 52-55 depend from independent claim 51 and recite additional features of the invention. These dependent claims also cannot be anticipated by the teaching of Hirayama for at least the same reasons discussed above.

Independent claim 62 also cannot be anticipated by the teaching of Hirayama because the reference also fails to disclose each and every element recited therein. For example, Hirayama fails to disclose a method of treating water comprising a step of accumulating water from a point

of entry at pressure that is above atmospheric pressure. Further, Hirayama fails to disclose a method of treating water comprising a step of adjusting at least one operating parameter of the electrochemical device. Contrary to what is alleged, Hirayama does not teach a “means for adjusting electrical current parameter to the electrochemical device.” Instead, Hirayama mentions that the electrodeionization apparatus 27 “was not flown with electrical current during the second step.” Thus, Hirayama teaches that the electrochemical device is not operated and thus cannot perform a step of adjusting at least one operating parameter thereof.

Dependent claim 65 depends from independent claim 62 and further recites additional features of the invention. This claim also cannot be anticipated by the teaching of Hirayama for at least the same reasons discussed above.

Claims 51-54, 62, and 65-70 are rejected under 35 U.S.C. § 102(e) as being anticipated by the teaching of Willman.

Applicants also disagree that independent claim 51 is anticipated by the teaching of Willman. As amended, independent claim 51 is directed to a water treatment system comprising means for accumulating water from a water source at a pressure above atmospheric pressure, an electrochemical device fluidly connected to the means for accumulating water, and means for heating the water. Contrary to what is alleged, Willman does not disclose accumulating water from a point of use in a storage tank that is pressurized by way of a booster pump. As Willman notes, a reverse osmosis unit is disposed upstream of a storage tank. A booster pump is utilized to provide osmotic pressure to facilitate the separation in a reverse osmosis unit. Permeate from the reverse osmosis unit is stored in the storage tank but cannot be considered to be accumulated water from a water source at a pressure that is above atmospheric pressure because the pressure thereof has been reduced as a result of treatment through the reverse osmosis unit. Further, Willman fails to disclose a water treatment system comprising means for heating the water. Thus, independent claim 51 cannot be anticipated by the teaching of Willman because the reference fails to disclose each and every recited element.

Dependent claims 52-54 depend from independent claim 51 and further recite additional features of the invention. These dependent claims also cannot be anticipated by the teaching of Willman for at least the same reasons discussed above.

Independent claim 62 also cannot be anticipated by the teaching of Willman because Willman also fails to disclose a method of treating water comprising a step of accumulating water from a point of entry at a pressure that is above atmospheric pressure. Instead, as noted above, permeate is stored in the storage tank. Willman also fails to disclose a method of treating water comprising a step of adjusting at least one operating parameter of the electrochemical device. Thus, independent claim 62 cannot be anticipated by the teaching of Willman.

Dependent claims 65-67 depend from independent claim 62 and recite additional features of the invention. These dependent claims also cannot be anticipated by the teaching of Willman for at least the same reasons discussed above.

Independent claim 68 is directed to a system comprising a fluid reservoir in thermal communication with a heat exchanger. Willman, however, fails to disclose a system comprising a reservoir in thermal communication with a heat exchanger. Thus, independent claim 68 cannot be anticipated by the teaching of Willman.

Dependent claim 69 depends from independent claim 68 and recites additional features of the invention. This dependent claim also cannot be anticipated by the teaching of Willman for at least the same reasons discussed above.

Independent claim 70 also cannot be anticipated by the teaching of Willman because Willman fails to disclose a method of facilitating water treatment comprising providing a system having a pressurizable reservoir system that is fluidly connectable to a point of entry and an electrochemical device fluidly connected to the pressurizable reservoir system.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 is respectfully requested.

Rejections Under 35 U.S.C. § 103

Claim 26 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Willman in view of the teaching of Rela in U.S. Patent No. 6,607,668 (hereinafter Rela).

Applicants disagree that claim 26 would have been obvious over the teaching of Willman in view of the teaching of Rela. The rejection is improper because no prima facie case of

obviousness has been set forth that provides a suggestion or motivation to combine the teachings of the references.

Further, even if the teachings could have been combined, which Applicants do not concede, the resultant combination would lack at least one element recited in dependent claim 26. Dependent claim 26 depends from independent claim 21. As noted above, independent claim 21 cannot be anticipated by the teaching of Willman because the reference fails to disclose each and every limitation recited therein. Rela fails to remedy the deficiencies of Willman and thus the proposed combination would lack at least one limitation of dependent claim 26. Therefore, dependent claim 26 would not have been obvious over the teaching of Willman in view of the teaching of Rela.

Claim 28 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Willman in view of the teaching of Hirayama.

Dependent claim 28, like claim 26, also would not have been obvious over the teaching of Willman in view of the teaching of Hirayama. The rejection is also improper because no prima facie case of obviousness has been set forth that provides any suggestion or motivation to incorporate a heat exchanger from the teaching of Hirayama into the teaching of Willman. Hirayama utilizes a heat exchanger to raise the temperature of water so as to sterilize the system that produces water for pharmaceutical purposes. Willman teaches utilizing an electrochemical device to improve the water recovery rate of reverse osmosis based purification systems. No suggestion or motivation has been identified to incorporate a heat exchanger into the teaching of Willman. Moreover, Willman already discloses a technique for restricting bacterial growth in the system by utilizing an ultraviolet-light treatment unit. (See Willman at FIG. 3 and paragraph 29.) No motivation has been presented to support substituting the UV light device with a heat exchanger. Moreover, even if the teachings could have been combined, which Applicants also do not concede, the resultant combination would lack at least one limitation recited in dependent claim 28. For example, the resultant combination would fail to disclose a treatment system comprising a reservoir system that is fluidly connected to a point of entry.

Claims 29 and 43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Willman in view of Arba et al. in U.S. Patent No. 6,398,965 (hereinafter Arba).

Applicants also disagree that dependent claims 29 and 43 would have been obvious over the teaching of Willman in view of the teaching of Arba. The rejection is also improper for

failing to support prima facie case of obviousness because no suggestion or motivation has been provided for incorporating an irrigation system into the system disclosed by Willman.

Moreover, claims 29 and 43 depend from independent claims 21 and 40, respectively. Because, as discussed above, Willman fails to teach each and every element of these independent claims and because Arba fails to remedy these deficiencies, any combination of these teachings would fail to teach each and every element recited in dependent claims 29 and 43.

Claims 63 and 64 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Hirayama in view of the teaching of Sato et al. in U.S. Patent No. 6,733,646 (hereinafter Sato).

Dependent claims 63 and 64 also would not have been obvious over the teaching of Hirayama in view of the teaching of Sato. These dependent claims depend from independent claim 62, which as noted above, cannot be anticipated by the teaching of Hirayama. Sato fails to compensate the deficiencies of Hirayama. Moreover, no suggestion or motivation to combine the teaching of Hirayama with the teaching of Sato has been provided. Therefore, dependent claims 63 and 64 would not have been obvious over the combined teachings of Hirayama and Sato because no prima facie case of obviousness has been presented and because the alleged combination would lack at least one element recited in these claims.

Conclusion

In view of the foregoing Amendments and Remarks, this application is now in condition for allowance. A notice to this effect is respectfully requested. If the examiner believes that the application is not in condition for allowance, the examiner is requested to call Applicants' attorney at the telephone number listed below.

If this Response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50/0214.

Respectfully submitted,
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